

CHAPTER 12. EASEMENTS AND MAINTENANCE**CONTENTS**

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1.0 OVERVIEW

1.1 General

Drainage easements shall be provided for all conveyances of runoff to the public drainage system outside of public right-of-way. The public drainage system begins at the point where drainage from one property or public right-of-way drains onto another property or public right-of-way. The required easement widths and maintenance responsibilities for the drainage system are covered in this chapter.

Proper maintenance of storm water control facilities is essential for effective flood control, water quality management, and the health, safety and welfare of the public. Maintenance includes both routinely scheduled activities and non-routine repairs that may be required after heavy storm events or as a result of other unforeseen problems. As noted in previous chapters, designing facilities with maintenance in mind is critical for long-term functionality. Successful long-term maintenance is dependent on many factors, including appropriate design, good access, a maintenance plan that is adequately developed and funded, and maintenance practices that are in accordance with good public works standards.

Easements for the storage and conveyance of storm water and maintenance of the storm water system may be established by any of the following methods:

1. Identification on a recorded plat drawing.
2. Recording the easement in written form (paper easement).
3. Prescriptive easement. (Easements that a public entity inherently owns along waterways that are part of the public drainage system or have been historically improved and maintained by the public entity.)

This chapter provides a performance-based maintenance standard to maintain function and safety throughout the storm water system. The guidelines provided herein to achieve this standard are not all-inclusive and should be applied with common sense and good engineering judgment.

1.2 Authority

The Springfield City Code authorizes requirements for maintenance in various sections including:

- Chapter 96, Storm Water (Section 96-1) addresses the requirement of responsible parties to maintain the function and safety of watercourses, sinkholes, detention basins, and other constructed or natural sections of the drainage system. It also addresses restrictions related to

discharging pollutants to the drainage system. (See Chapter 2, Authority and Law, or refer to the City Code for more information.)

- Chapter 36 Land Development, authorizes the Director of Public Works to require public improvements in accordance with the *City of Springfield, Missouri, Design Standards for Public Improvements*, including this manual, and provides authority to require easements through the subdivision process.
- Chapter 36, Zoning Ordinance, gives authority through the building permit process to require drainage improvements in accordance with all other City codes and ordinances.

Maintenance violations may result from the intentional or unintentional alteration of a watercourse or storm water facility due to human activities or from naturally occurring events. Violations can also result from lack of maintenance and repair of a watercourse or storm water facility. In many cases, the City maintains the right to enter a property and make necessary corrections if they are not corrected by the property owner.

1.3 Inspections

Regular inspections of drainage facilities are key to maintaining a properly functioning and safe drainage system. At a minimum, inspections should be made by property owners on an annual basis. In addition, inspections should occur on a regular basis, particularly after rainfalls, to determine if any changes have occurred that require action to maintain the functionality and safety of the drainage system.

2.0 EASEMENT REQUIREMENTS

Drainage easements shall be provided for all public drainages flowing across any proposed development. Generally, private, onsite drainage does not require a drainage easement. In some cases, additional drainage improvements and easements may be required upstream or downstream of a new development to address potential impacts of the development.

2.1 Minimum Boundaries

Easements must be provided to contain the 100-year flow based on proposed elevation contours of the site and fully developed conditions of the contributing watershed. The minimum width of a required drainage easement is determined based on the type of drainage facility, as summarized in Table EAS-1, assuming the improvement is centered within the easement. Additional width may be required for maintenance access. A discussion of required easements for various types of facilities is provided in Sections 2.1.1 through 2.1.3.

**Table EAS-1
Minimum Drainage Easement Boundaries**

Conveyance System	Minimum Boundary
24-inch diameter or less	10 feet
> 24-inch diameter to 42-inch diameter	15 feet
> 42-inch diameter	20 feet
Reinforced Concrete Box	10 feet wider than box outer wall
Vegetated Channel	Entire channel width
Structural (Hard Improved) Channel	10 feet wider than channel (5 feet beyond the outside edge of the structure on each side)
Natural/Unimproved Channel	100-year flood boundary

2.1.1 Enclosed System

Easements for an enclosed drainage system and constructed open channels must be adequate to allow for future maintenance of the structure, including its possible removal and replacement. Flowline depths greater than 4 feet may warrant widths exceeding these minimums. When the flowline depth of an enclosed drainage system or constructed open channels exceeds 4 feet, the drainage easement should extend from the edge of the structure for a distance equal to the depth of the flowline plus 1 foot. If the an enclosed system is designed for the 25-year flow and the 100-year flow results in an overflow on the ground surface, the required easement width will shall be governed by the width of the ground surface overflow if it is wider than the minimums listed in Table EAS-1.

2.1.2 Constructed Open Channels

Easements must be adequate to allow for future maintenance of the channel, including possible removal and replacement. In the case of vegetated channels, the easement shall cover the entire channel. In the case of structural channels, the easement shall extend 5 feet beyond the outside edge of the top of the structure. When the flowline depth exceeds 4 feet, the drainage easement should extend from the edge of the structure for a distance equal to the depth of the flowline plus 1 foot.

2.1.3 Natural Channels

Easements must be adequate to encompass the 100-year flood boundary under fully developed watershed conditions and the most restrictive flow conditions.

2.2 Land Use Restrictions

Drainage easements are areas that, based on engineering analysis, have been determined to be necessary for the conveyance of the 100-year flow, are anticipated to be inundated by the 100-year flood,

or are necessary for the maintenance of the drainage system. These areas must be kept free and clear of obstructions that could impede the flow of water, development that could be damaged by inundation, or development that could create a safety risk or nuisance for the public. No grading or placement of fill, structures, fences, or parking lots shall be permitted within a drainage or detention easement without approval by the Department of Public Works. Such approval may require an engineering analysis to clearly demonstrate any of the following:

- There will be no flooding impact on adjacent properties.
- The 100-year flood will remain within a drainage easement.
- No safety hazard or nuisance to the public will be caused.
- The drainage system can be properly maintained.
- For structures, the proposed structure must be properly flood-proofed as required by Building Development Services. When encroachment into the easement involves an enclosed structure, the area of encroachment shall be vacated as a drainage easement.
- For parking lots, there shall be no water depths in the area exceeding 6 inches during the 100-year flood.

For fences, an exception will be made when it can be shown that reasonable action has been taken to allow for the conveyance of the 100-year flow, and the conditions listed above have been met. Chain link fences are generally considered to be acceptable in drainage easements with the exception of areas where concentrated flows exist and vegetation or other debris may collect on the fence.

The City, as necessary to maintain the drainage system and the flow of water, retains the right to remove any structures, fences, fill, or parking lot or other facility used for the movement of vehicular or pedestrian traffic placed within a drainage easement without approval of the Public Works Department.

3.0 MAINTENANCE RESPONSIBILITY

Maintenance of drainage facilities is generally the responsibility of the entity owning the facility. Maintenance responsibilities may be further clarified in other legally binding documents such as recorded final plats, recorded paper easements and subdivision covenants. Additionally, information regarding how the facility is to be maintained may be found in the original construction documents.

3.1 Subdivisions

Generally, all drainage facilities in new subdivisions that are outside the public right-of-way shall be maintained by a property owners association or the property owner. Larger facilities within a subdivision, such as detention basins, channels, and large boxes and pipes, shall be located within a Common Area that is owned and maintained by the association. The following statement shall be placed on all final plats:

All Common Areas shall be considered drainage easements. All Common Areas are to be maintained by the property owners association. All drainage easements are to be maintained by the property owner.

Subdivision covenants establishing the property owners association and giving it the responsibility and authority to collect the necessary fees to properly maintain common areas and drainage facilities must be accepted and recorded through the Department of Planning and Development. Article 1 Land Development Code, Section 5-2304 identifies requirements for common area maintenance in subdivision covenants or other legal documents. Subdivision covenants are required to include specific language regarding maintenance, including the right of the City to intercede and maintain common areas and recover costs associated with such maintenance.

Smaller facilities within a subdivision, such as small pipes and swales, are typically within a drainage easement maintained by the property owner. Generally, for facilities maintained by individual homeowners, the property owner must maintain the surface (trash pickup, mowing, minor erosion repair), and the City will correct major deficiencies such as structural failure of a box, pipe or wall, or a major erosion problem.

If the party with primary responsibility fails to properly maintain any drainage facility and the City has notified the party of the deficiency, the City shall have the right to enter the property in order to maintain the facility and charge the primary responsible party for any costs associated with the work.

3.2 Existing Facilities with No Easement

Existing drainage facilities that are not within a drainage easement shall be maintained by the property owner. On major waterways where it is determined the City has a prescriptive easement, the City may conduct maintenance in the form of brush or tree removal, removal of large amounts of debris or sediment, stream stabilization, or structural repairs. Maintenance may be conducted to maintain flow capacity, reduce pollution and sediment into the waterway, and maintain the safety, health and welfare of the public.

If a drainage easement does not exist, the responsibility to maintain the facility falls to the property owner. The City may accept an easement from the property owner or assume maintenance responsibility through a prescriptive easement. In any case, minor maintenance of the surface, including mowing and trash pickup, is the responsibility of the property owner.

3.3 Major Drainage Facilities

Major drainage facilities include large channels, detention basins, hydraulic structures, and culverts. Sections 3.3.1 through 3.3.3 provide key maintenance requirements for each of these.

3.3.1 Major Channels and Floodplain

Major drainage channels may be natural or constructed. Natural channels and their floodplains may consist of grass, trees, roots and other vegetation, cobble, boulders, bedrock, soil or other natural materials. Constructed channels may consist of grass, concrete, riprap, blocks or other materials. Maintenance requirements for each channel type follow.

3.3.1.1 Natural Channels

Maintenance of natural channels and their floodplains should be conducted with great care. Natural channels can be dynamic in nature, and it can be difficult to predict how they will respond to changes made to them. In areas where the entire floodplain has been preserved as open space, natural channels can generally be left to move and change. Maintenance intervention may be necessary in cases where debris, sediment or channel movement is threatening the integrity of a structure, causing a potential flood hazard, or causing excessive erosion or stream degradation. In areas where development has encroached into floodplains or is near a natural channel, the channel and floodplain should be kept clear of debris, structures, fill, fences and other potential blockages. Excessive vegetation growth should be controlled to maintain channel capacity and prevent damage to adjacent properties. See Section 3.5 below for additional information regarding vegetation management.

3.3.1.2 Constructed Channels

Maintenance of constructed channels must include maintaining the original design capacity and structural integrity of the channel. The channel capacity should never be decreased by maintenance activities unless a thorough engineering study has concluded the action is acceptable. Maintenance of concrete channels can include sediment removal, structural and sub-grade repairs and vegetation control. Grass channels must be mowed to heights that cannot exceed 12 inches in accordance with the City Code, Section 74-401 *et. seq.*

3.3.2 Enclosed Systems and Culverts

Box culverts and pipes shall be kept clear of debris and sediment. Any removed debris or sediment shall be hauled from the site rather than placed in the drainage system. Flushing shall be completed only when limited access makes it absolutely necessary. Any structural deficiencies such as cracked or damaged concrete shall be reported to the Department of Public Works and corrected with the assistance of a qualified engineer.

3.3.2 Detention Storage Basins

Detention storage includes dry detention, extended detention, and wet detention ponds. The following maintenance measures shall be implemented on all detention basins:

- Storage volume in basins must be preserved through regular maintenance and removal of sediment. Sediment should be removed and the basin returned to design grades when either a sediment depth of 6 inches exists or more than 10 percent of the design volume has been lost. Sediment removal in wet ponds requires draining of the pond.
- The storage area and outlet structure shall be inspected to ensure that they are functional, free from debris and have no structural deficiencies in need of repair.
- Erosion of riprap, vegetation or soil, particularly near discharge pipes into the basin, shall be repaired and restored to the original design.
- Vegetation and aesthetic features including fences, shrubs, trees, native grasses, and water quality vegetation shall be maintained to function and provide safety to the public. See Section 3.5 for mowing and vegetation requirements.

Basins should be inspected on an annual basis. Additional periodic inspections should be made, particularly after rainfall events, to ensure the basin meets the requirements of this chapter and is functional.

Seed and mulch, sod, or other necessary best management practices (BMPs) shall be placed immediately after any excavation or grading is complete to minimize erosion and discharge of sediment to the drainage system.

Routine maintenance to return a facility to its intended designed condition may be conducted without specific permission by the City. Modified designs shall be submitted to the Department of Public Works for approval.

3.3.3 Hydraulic Structures

Maintenance of hydraulic structures, including riprap, grade control structures, or any other structures in the drainage system, may include the following:

- Removal of debris, excessive vegetation, and excessive sediment.
- Replacing riprap or boulders and repairing grout and concrete.
- Inspecting adjacent banks and structures for erosion damage and repairing, as needed.
- Repairing guardrails and fences, as needed.

3.4 Storm Water Quality BMPs

Storm water quality BMPs are designed to treat and improve storm water quality and therefore may require higher levels of maintenance to serve their designed functions. Specific maintenance requirements of any BMP should be provided on the original design plan. General maintenance requirements for basic BMPs are provided in Sections 3.4.1 through 3.4.4.

3.4.1 Extended Dry Detention and Wet Detention Basins

Maintenance requirements for water quality basins include the previously identified requirements for detention basins in Section 3.3.2 of this chapter, as well as these additional maintenance requirements:

- Replacement or cleaning of gravel filters on perforated risers for extended dry detention basins.
- Replacement of special vegetation such as wetland plants.

3.4.2 Grass Swales and Buffer Strips

Grass buffers and swales require general maintenance similar to that of grass open channels. Because grass swales and buffers may be designed with less slope to slow velocities and treat runoff, additional attention should be given to repair of any rills or gullies due to wet conditions. Healthy vegetation can generally be maintained without using fertilizers because runoff from lawns and other areas contains the needed nutrients. Sediment removal and replacement of vegetation may be necessary. Use of native vegetation may require development of specific maintenance plans by a qualified professional. See Section 3.5 for more information on vegetation maintenance.

3.4.3 Low Impact Development (LID) Designs

LID designs are gradually gaining acceptance and generally require a qualified specialist to design and develop a maintenance plan. LID designs encourage maximum contact of storm water with vegetation and soil and discourage directly connected impervious areas. LID designs may include:

- Porous landscape detention
- Rain gardens
- Constructed wetland basins and channels
- Bioretention cells

LID designs may include a variety of vegetation types that may exceed the City's normal height limitations for vegetation, provided that the vegetation does not cause a nuisance or threat to the public health, safety, and welfare. In addition, effective LID design is often based on infiltration of runoff into the soil. Because these processes are fundamental to effective LID design, maintenance of these facilities may require specialized procedures beyond those discussed in this chapter. Special maintenance procedures may be necessary regarding:

- Sediment removal
- Aquatic plant harvesting
- Forebay management
- Soil amendments and replacement
- Mulch replacement
- Underdrain maintenance

LID features, called Integrated Management Practices, are typically designed to be dispersed throughout individual sites throughout a development rather than being regional in nature. Once a LID feature has been designed and installed, it shall be maintained by the property owner in accordance with the approved maintenance plan and shall not be removed without the approval of the Department of Public Works. A request for removal must provide sound technical reason for why the facility is a hardship to maintain or is detrimental to the public. It may not be removed because of aesthetic preferences of the property owner. Additional information regarding water quality management and LID may be found in

Chapter 10, Water Quality. Reference may also be made to the LID Center website (www.lid-stormwater.net) for more information regarding LID.

3.4.4 Subsurface and Package Treatment Devices

Subsurface and package treatment devices are generally proprietary in nature and require specific approval by the Department of Public Works prior to installation. While more conventional methods of water quality management, such as those described above, are generally preferred, subsurface and package treatment devices may be allowed where a proposed development is high density with limited space or where a land use with high pollution risk is in close proximity to a sensitive water resource feature and above-ground approaches are not feasible. These devices shall be maintained by a property owners association or individual property owner. Regular inspections and maintenance (often requiring specialized equipment) are required to maintain their designed effectiveness.

3.5 Mowing and Vegetation Management

Property within the City is required to be mowed and maintained to meet the City Code, Section 74-401 *et. seq.* that states grass heights cannot exceed 12 inches. Facilities that incorporate vegetation with heights greater than 12 inches for water quality or other beneficial purposes are allowed, provided that the vegetation does not cause a nuisance or threat to the public health, safety, or welfare. Plans for water quality treatment systems that require the installation and maintenance of native vegetation and infiltration systems will require specific design and maintenance plans to be approved by the Department of Public Works and must be installed and maintained by the property owner.

4.0 REFERENCES

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Low Impact Development (LID) Center. 2003. Low Impact Development (LID) Urban Design Tools. <http://www.lid-stormwater.net/>.

Urban Drainage and Flood Control District. 1999. *Urban Storm Drainage Criteria Manual, Volume 3, Stormwater Best Management Practices*. Denver, CO: Urban Drainage and Flood Control District. Also see the UDFCD website for updates to Volume 3 BMP maintenance recommendations (www.udfcd.org).

Water Environment Federation and American Society of Civil Engineers. 1992. *Design and Construction of Urban Stormwater Management Systems*. ASCE Manual and Reports of Engineering Practice No. 77 and WEF Manual of Practice FD-20. Alexandria, VA: Water Environment Federation.

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